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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,679	02/04/2002	Tse-Ming Lin	B-4489 619501-5	7126

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LADAS & PARRY  
5670 WILSHIRE BOULEVARD, SUITE 2100  
LOS ANGELES, CA 90036-5679

EXAMINER

KNAPP, JUSTIN R

ART UNIT PAPER NUMBER

2182

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/067,679	<b>Applicant(s)</b> LIN, TSE-MING	
	<b>Examiner</b> Justin Knapp	<b>Art Unit</b> 2182	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuan et al (hereby Yuan), USPN 6,526,477 in view of Caldwell et al (hereby Caldwell), USPN 6,748,469 in further view of Townsend et al (hereby Townsend), USPN 5,974,562.

4. As per claim 1, Yuan teaches:

a disk array control unit (figure 2A, #208), having a parallel interface for transmitting and receiving a plurality of parallel signals (#208 is a SCSI RAID controller which would have parallel SCSI interfaces to communicate with drives #212) and a shared bus interface for transmitting and receiving stored data (figure 2A, #204).

Yuan does not explicitly teach:

an interface converter, for converting the plurality of parallel signals from the disk array control unit into a plurality of corresponding differential signals and converting a plurality of external differential signals into the plurality of corresponding parallel signals which is then output to the parallel interface.

However, Caldwell teaches a SCSI converter module (figure 4, #402) that converts parallel data into corresponding differential signals and vice versa (figure, #402, 404, 406, 414). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the SCSI converter of Caldwell with the system of Yuan as converting to differential signals provides a smaller foot print on the interface, enhanced interconnection options, increased data transfer rates, and longer interconnects (Caldwell, column 3, line 60 through column 4, line 11).

Neither Yuan nor Caldwell explicitly teach a network interface unit, having a network I/O port connecting with an external network, the network interface unit connected to the shared bus interface, for passing the stored data from the shared bus interface through the network I/O port to the external network, and for passing remote data from the external network through the network I/O port to the shared bus interface.

Townsend teaches a network interface unit (figure 3, #354), having a network I/O port connecting with an external network (#326), the network interface unit connected to the shared bus interface (#314), for passing the stored data from the shared bus interface through the network I/O port to the external network, and for passing remote data from the external network through the network I/O port to the shared bus interface (column 3, line 40 through column 4, line 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a network interface unit of Townsend within a system of Yuan in view of Caldwell as having a network interface unit would provide file sharing access to the RAID controlled hard disks to other workstations over a network thus saving disk space on other workstations.

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5. As per claims 2, Yuan in view of Caldwell in further view of Townsend does not explicitly teach:

a plurality of parallel-to-serial signal converters, for receiving and converting the parallel signals into a plurality of corresponding digital serial signals when the disk array control unit transmits data to the interface converter, and for converting the digital serial signals into corresponding parallel signals when the interface converter transmits data to the disk array control unit; and

a plurality of differential transceivers, for converting the digital serial signals into a plurality of corresponding differential signals when the disk array control unit transmits data to the interface converter, and for converting the differential signals into corresponding digital serial signals when the interface converter transmits data to the disk array control unit.

However, Caldwell does teach a SCSI converter module (figure 4, #402) with a parallel-to-serial converter (#416) and differential transceiver (#406) within the module. It would have been obvious to one of ordinary skill in the art at the time the invention was made to duplicate for multiple effect the SCSI converter module taught by Caldwell as to have a plurality of SCSI converter modules to have one SCSI converter module for each connection between the RAID controller (Yuan, figure 2a, #208) and each of the disk drives (#212). See Duplicating part for multiple effect - *In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960).

6. As per claims 3 and 10, Caldwell teaches wherein the differential transceiver is a low voltage differential signal transceiver (figure 4, #406).

7. As per claims 4 and 11, Yuan teaches wherein the disk array control unit is a RAID controller, providing at least two RAID levels of disk fault tolerance (figure 2, #208).

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8. As per claims 5, 12, and 13, Yuan in view of Caldwell in further view of Townsend does not explicitly teach wherein the parallel interface and disk interface signal is IDE/ATA compatible. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the IDE/ATA standard as it would provide greater compatibility and market share in a competitive computer market.

9. As per claims 6 and 14, Townsend teaches:  
a media access control circuit, for converting the stored data from the shared bus interface into a bitstream compliant with an Ethernet MAC layer protocol when the disk array control apparatus transmits data to the external network, and converting the bitstream to a format compatible with the shared bus interface when the disk array control apparatus receives data from the external network; and

a physical circuit, for exchanging the bitstream from the MAC circuit with a network physical signal of the remote data (figure 3, #354, these are obvious characteristics to any network interface unit as they are essential to functionality).

10. As per claims 7-9 the claims recites similar limitations as claims rejected above and are rejected on the same basis. Furthermore, Yuan teaches:

a plurality of disk devices, each providing a disk interface signal (figure 2, #212).

Yuan in view of Caldwell in further view of Townsend does not explicitly teach:

a second interface converter, for converting the disk interface signals into the plurality of corresponding differential signals received by the first interface converters, and converting the plurality of differential signals from the first interface converter into corresponding disk interface signals which is then output to the disk devices;

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a plurality of first parallel-to-serial signal converters, receiving and converting the plurality of parallel signals into a plurality of corresponding first digital serial signals when the disk array control unit transmits data to the first interface converter, and converting the plurality of first digital serial signals into the plurality of corresponding parallel signals when the first interface converter transmits data to the disk array control unit; and a plurality of first differential transceivers, converting the first digital serial signals into a plurality of corresponding differential signals when the disk array control unit transmits data to the first interface converter, and converting the differential signals into corresponding first digital serial signals when the first interface converter transmits data to the disk array control unit; or

a plurality of second parallel-to-serial signal converters, converting the disk interface signals into a plurality of corresponding second digital serial signals when the disk device transmits data to the second interface converter, and converting the plurality of second digital serial signals into the corresponding disk interface signals when the second interface converter transmits data to the disk device; and a plurality of second differential transceivers, converting the second digital serial signals into the plurality of corresponding differential signals when the disk device transmits data to the second interface converter, and converting the plurality of differential signals into the plurality of corresponding second digital serial signals when the first interface converter transmits data to the second interface converter.

As taught above, Caldwell does teach a SCSI converter module (figure 4, #402) with a parallel-to-serial converter (#416) and differential transceiver (#406) within the module to convert parallel signals to serial to differential. It would have been obvious to one of ordinary skill in the art at the time the invention was made to duplicate for multiple effect the SCSI

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converter module taught by Caldwell as to have a plurality of SCSI converter modules to have one SCSI converter module for each connection between the RAID controller (Yuan, figure 2a, #208) and each of the disk drives (#212). See *In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960).

Furthermore, Caldwell teaches deserializing the signals back to parallel signals (figure 4, 416). It would have been obvious to one of ordinary skill in the art to reverse the parts of the SCSI converter module taught by Caldwell to create a plurality of second converter for converting differential signals back to parallel SCSI signals to be sent to the disk drives of Yuan (figure 2, #212). See *Reversing parts - In re Gazda*, 219 F.2d 449, 452, 104, USPQ 400, 402 (CCPA 1955). One would have been motivated to do this as it would allow a user to continue use the parallel SCSI drives of Yuan thus saving hardware costs but additionally, to enjoy the advantages of serial transmission as taught by Caldwell (Caldwell, column 3, line 60 through column 4, line 11).

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Knapp whose telephone number is (571)272-4149. The examiner can normally be reached on Mon - Fri 8:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on (571)272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**JEFFREY GAFFIN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2100**

Justin Knapp  
Examiner  
Art Unit 2182

March 7, 2005

